CLAIMS:

1. A process for producing acrolein and acrylic acid through vapor phase catalytic oxidation of propylene with molecular oxygen or molecular oxygen-containing gas using a fixed bed shell-and-tube reactor, which comprises preparing plural kinds of catalysts which are formed of complex oxides of the composition expressed by a general formula (1):

$$Mo_a W_b Bi_c Fe_d A_e B_f C_g D_h E_i O_x$$
 (1)

(wherein Mo is molybdenum; W is tungsten; B is bismuth; Fe is iron; A is at least an element selected from cobalt and nickel; B is at least an element selected from phosphorus, tellurium, arsenic, boron, antimony, tin, cerium, niobium, lead, chromium, manganese and zinc; C is at least an element selected from alkali metal elements; D is at least an element selected from alkaline earth metal elements; E is at least an element selected from silicon, aluminum, titanium and zirconium; and O is oxygen; a, b, c, d, e, f, g, h, i and x denote the atomic numbers of Mo, W, Bi, Fe, A, B, C, D, E and O, respectively, and where a is 12, b is 0-3, i is 0-30, and x is a numerical value which is determined depending on the extent of oxidation of each of the elements)

and which are different from each other in

- (α) φccupying volume,
- (β) /calcining temperature and/or
- (γ) kind and/or amount of the alkali metal element, and filling the reaction zones provided by dividing the catalyst layer in each of the reaction tubes in the fixed bed shell-and-tube reactor

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into at least two layers in the axial direction of the tube, sequentially with said plural kinds of catalysts in such a manner that the catalytic activity increases from the starting gas inlet side toward the outlet side.

- 2. A process according to Claim 1, in which the number of reaction zones is 2 or 3.
- 3. A process according to Claim 1 of 2, in which a starting gas whose propylene concentration is at least-9-volume % is introduced.

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